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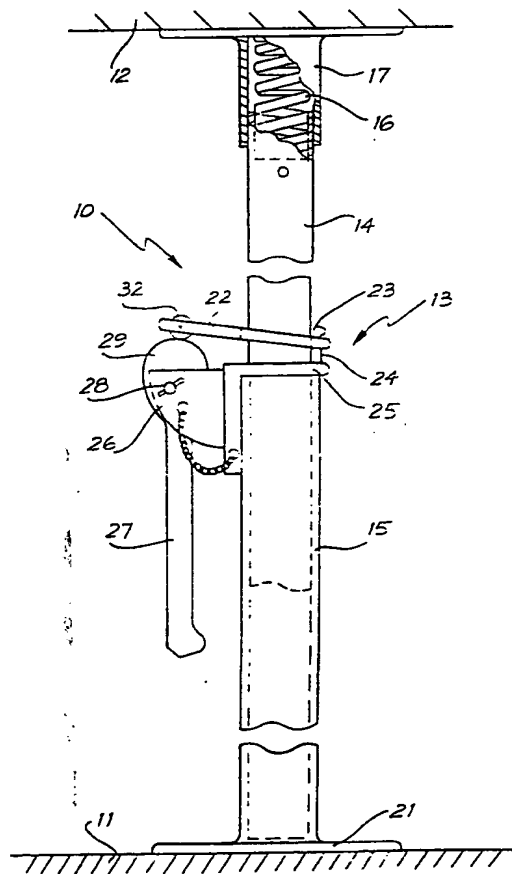
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None

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(54) Telescopic mine roof-support

(57) A mining roof support 10 which includes a main body 13 consisting of a pair of telescopically associated elongated members 14 and 15 which slide relative to each other to extend the support, engaging one of the members 14 or 15. A locking plate 23 which is movable into engagement with the member 14 by means of a lever operated cam 27 causes tilting of the plate 23 to engage the member 14 and then to raise the member 14, and lock it in the raised position.



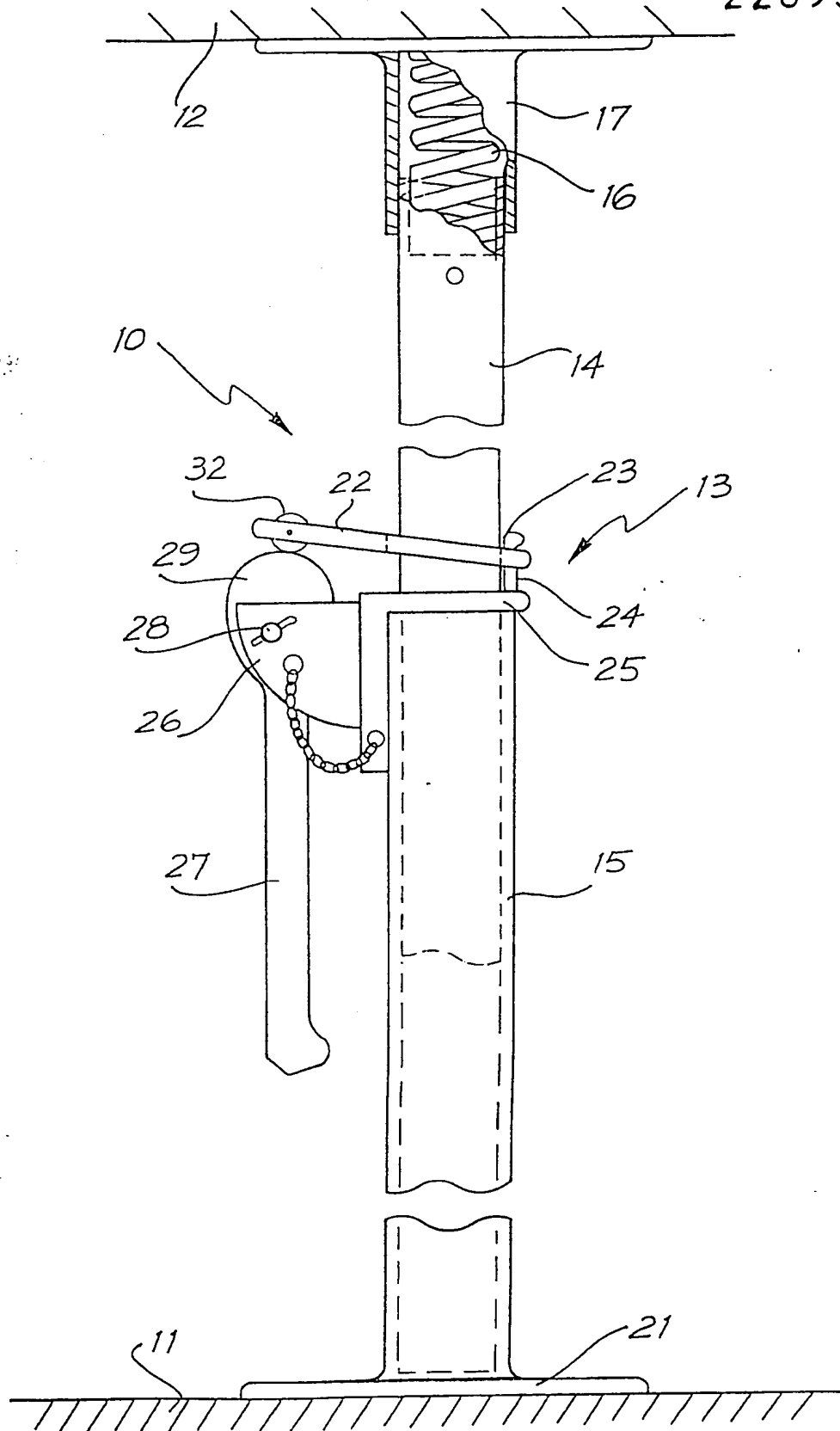
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The present invention relates to jacks and more particularly but not exclusively to jacks which are used in support systems for mines.

Generally in the mining industry, jacks are used to support roof members while roof bolting is performed. Timber pit props are also used for roof support and for locating and fixing of ventilation panelling. Existing apparatus used have operational problems due to their slowness of deployment, initial high cost, slowness of removal, and in the case of timber props, the necessity to discard the item once it has been cut to a particular length for its initial situation.

Disclosed in Australian Patent 567,834 is a jack which includes a pair of telescopically associated elongated members moved relative to each other by means of a lever operated cam acting on a plate which is movable angularly about an axis transverse of one of the elongated members between a release position and a locked position engaging the member.

The above discussed previously known jack employs a pair of springs which act on the locking plate during operation. It has been found that the springs are prone to damage due to their exposure and increase the cost of manufacture of the item.

It is the object of the present invention to overcome or substantially ameliorate the above disadvantages.

There is disclosed herein a jack comprising:

an elongated body consisting of two elongated members which are slidable relative to each other in the general direction of extension of the body;

a locking plate to engage an associated one of said members thereby enabling movement between the members to effectively elongate or shorten said body, said plate being movable relative to its associated member between a first position wherein said plate is movable relative to said associated member, and a second position securely engaging said

associated member;

cam means mounted on the other member and operatively associated with said plate to cause movement thereof, when in said second position, to cause relative movement between said elongated members to effectively elongate said body, said cam means including a lever pivotally mounted on said other member, and a cam surface fixed to said lever so as to rotate therewith, with said cam surface operatively associated with said plate to cause said relative movement; and

a generally rigid coupling member extending between said plate and the other member to said associated member.

A preferred form of the present invention will now be described by way of example with reference to the accompanying drawing, which schematically depicts in side elevation a jack to be used in the mining industry.

In the accompanying drawing there is schematically depicted a jack 10 to extend between the floor 11 and roof 12 of a mine tunnel.

The jack 10 consists of a main body 13 having two telescopically associated members 14 and 15 which slide relative to each other. More particularly, the member 15 would be of tubular form so as to slidably telescopically receive within it the cylindrical member 14.

The upper end of the member 14 is provided with a spring 16 which limits the load to which the jack 10 may be subjected. The spring 16 is of helical form and is provided with a ground engaging foot 17 within which it is located.

The lower end of the member 15 is provided with a pad 21 to engage the floor 11.

Movably attached to the member 14 is a locking plate 22 which has an aperture 23 through which the member 14 passes. The aperture 23 is shaped so that when the plate 22 is oriented generally normal to the longitudinal

axis of the member 14, the member 14 can move slidably through the plate 22. However when the plate 22 is inclined to the member 14, and sufficient force is applied thereto, the plate 22 will securely grip the member 14.

The plate 22 is attached to the member 15 via rigid pin 24 which has one
5 end secured to the plate 22 and the other end secured to a mounting member 25 fixed to the member 15. The pin 24 and mounting member 25 co-operate to bias the plate 22, under the influence of gravity, to a position abutting the member 25 to orient the plate 22 to a position allowing movement of the member 14 through the plate 22.

10 Attached to the mounting member 25 is a fulcrum 26 rotatably supporting a lever 27 via a pin 28. One end of the lever 27 is provided with a cam member 29 having a cam peripheral surface 30. Mounted on one end of the plate 22 is a cam follower 32 which is engaged by the cam surface 30.

15 The cam surface 30 is shaped so as to move the cam follower 32 away from the pin 28 when the lever 27 is rotated from a horizontal position to the position shown.

In operation of the above described jack 10, the jack 10 is initially extended manually so that the upper end of the member 14 is located
20 adjacent the tunnel roof 12 while the foot 17 rests on the floor 11. Thereafter an operator grips the lever 27 to cause pivoting movement thereof downward until member 15 is downwardly extending. Since the cam member 29 is attached to the lever 27, the cam surface 30 also rotates about the pin 28. This in turn causes pivoting of the plate 22 to a
25 position engaging the member 14, and further causes upward movement of the plate 22 which in turn causes upward movement of the member 14 to apply a force to the tunnel roof 12.

It should further be appreciated that the cam surface 30 is shaped relative to the axis of the pin 18 as well as the position of the cam

follower 32, such that as the lever 27 approaches the member 15, the cam surface 30 acts in co-operation with the cam follower 32 as an "over centre" mechanism so that the lever 27 is biased to the position shown. Accordingly the jack 10 is then locked in the extended position.

CLAIMS

1. A jack comprising:

an elongated body consisting of two elongated members which are slidable relative to each other in the general direction of extension of the body;

a locking plate to engage an associated one of said members thereby enabling movement between the members to effectively elongate or shorten said body, said plate being movable relative to its associated member between a first position wherein said plate is movable relative to said associated member, and a second position securely engaging said associated member;

cam means mounted on the other member and operatively associated with said plate to cause movement thereof, when in said second position, to cause relative movement between said elongated members to effectively elongate said body, said cam means including a lever pivotally mounted on said other member, and a cam surface fixed to said lever so as to rotate therewith, with said cam surface operatively associated with said plate to cause said relative movement; and

a generally rigid coupling member extending between said plate and the other member to said associated member.

2. The jack of Claim 1 wherein said coupling member is positioned on the opposite side of said associated member to said cam means.

3. The jack of Claim 1 or 2 wherein said locking plate has an aperture through which said associated member passes.

4. The jack of any one of Claims 1 to 3 further including a ground engaging foot movably attached to one of said members so as to be movable relative thereto along the general direction of extension of said body, and a spring biasing said foot to an extended position relative to said body.

5. The jack of Claim 4 wherein said foot is slidably mounted on one

of said bodies.

6. The jack of Claim 5 wherein said lever is movable between a first position extending generally normal to said body and a second position located adjacent said body, with said cam surface being attached to said lever so that when said lever is in the first position thereof, said plate is in the first position thereof, and when said lever is in its second position, said plate is located in its second position.

7. The jack of Claim 6 wherein said cam surface operates as an over centre mechanism to securely locate said lever in the second position thereof.

8. A jack substantially as hereinbefore described with reference to the accompanying drawings.